

United States
Department of
Agriculture

Soil
Conservation
Service

Bozeman,
Montana



MONTANA WATER SUPPLY OUTLOOK

May 1, 1986



Foreword

How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall. This snowfall accumulates high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are viewed in conjunction with snowpack data to prepare runoff forecasts. This report presents a comprehensive picture of water supply outlook conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data and narratives describing current conditions.

Streamflow forecasts are cooperatively generated by Soil Conservation Service and National Weather Service hydrologists. Forecasts become more accurate as more data affecting runoff becomes known. For this reason, forecasts are issued that reflect three future precipitation conditions — Below Normal, Average, and Above Normal. These forecasts are termed reasonable minimum, most probable, and reasonable maximum. Actual streamflow can be expected to fall between the lower and upper forecast values eight out of ten years.

Snowpack data are obtained by using a combination of manual and automated measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation, temperature, and other parameters are monitored on a daily basis and transmitted via radio telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

For More Information

Copies of Monthly Water Supply Outlook Reports and other reports may be obtained from the states listed below. Because of the limited space, snow survey measurements are not published in monthly reports. An annual snow survey data summary is published by the Soil Conservation Service for each of the western states. Historical snow survey data may be obtained at those same offices.

STATE	ADDRESS
Alaska	201 East 9th Ave., Suite 300, Anchorage, AK 99501-3687
Arizona	201 East Indianola, Suite 200, Phoenix, AZ 85012
Colorado (New Mexico)	2490 West 26th Ave., Denver, CO 80211
Idaho	304 North 8th Street, Room 345, Boise, ID 83702
Montana	10 East Babcock, Room 443, Federal Building, Bozeman, MT 59715
Nevada	50 South Virginia Street, Third Floor, Reno, NV 89505
Oregon	1220 Southwest 3rd Ave., 16th Floor, Portland, OR 97204
Utah	4402 Federal Building, 125 South State Street, Salt Lake City, UT 84147
Washington	360 U.S. Court House, Spokane, WA 99201
Wyoming	Federal Building, 100 East "B" Street, Casper, WY 82602

In addition to state reports, a Water Supply Outlook for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 547, Portland, OR 97209.

Published by other agencies:

Water Supply Outlook Reports prepared by other agencies include: California — Snow Survey Branch, California Department of Water Resources, P.O. Box 388, Sacramento, CA 95802; British Columbia — The Ministry of Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia, V8V 1X5; Yukon Territory — Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory, Y1A 3V1; Alberta, Saskatchewan, and N.W.T. — The Water Survey of Canada, Inland Waters Branch, 110-12 Avenue S.W., Calgary, Alberta, T3C 1A6.

Montana Water Supply Outlook

and

Federal – State – Private Cooperative Snow Surveys

Issued by

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Soil Conservation Service
Washington, D.C.

Released by

Glen H. Loomis
State Conservationist
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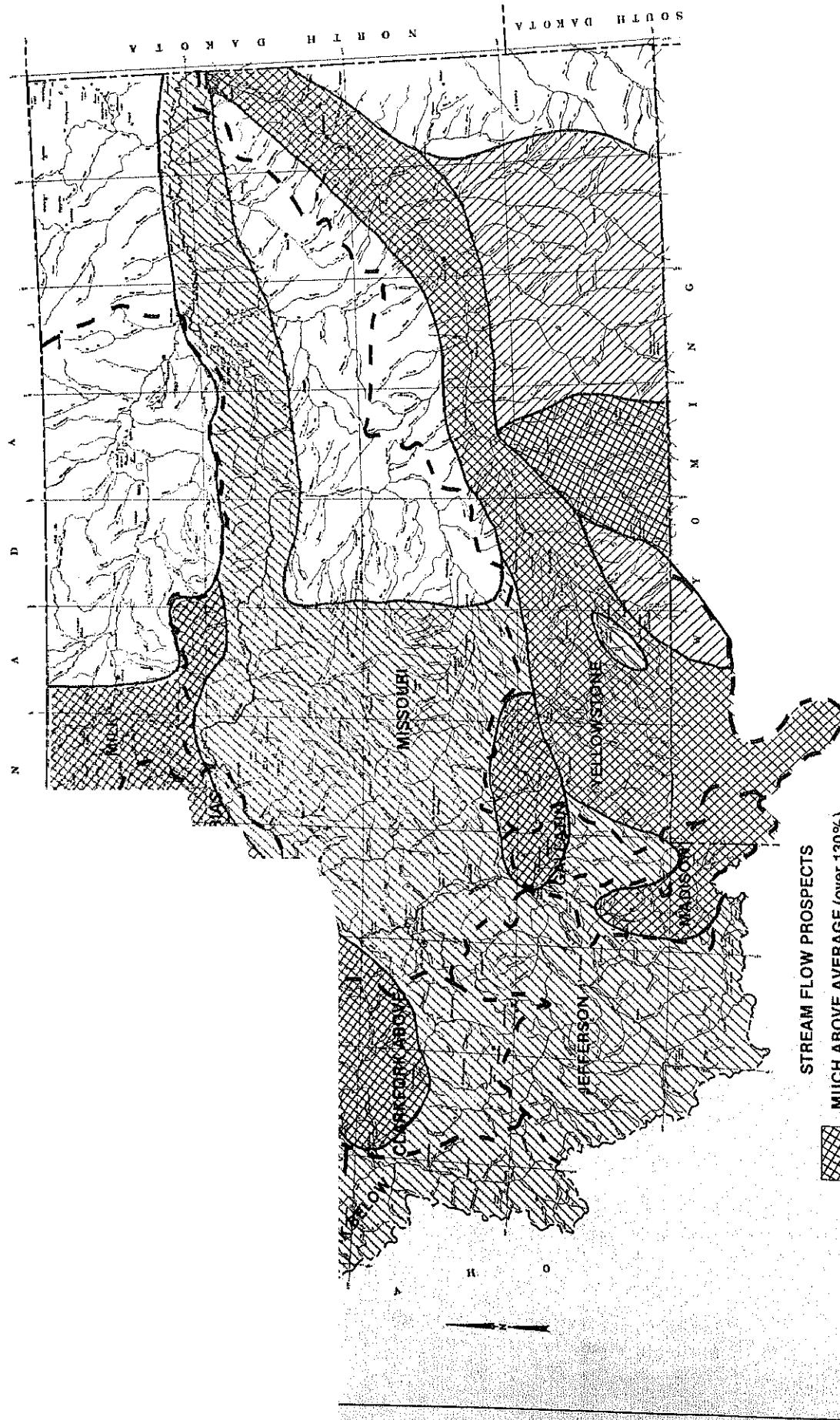
Prepared by

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STREAMFLOW PROSPECTS FOR MONTANA

Spring and Summer Period



May-September Forecasts

May 1, 1986

0 25 50 75 100 MI
0 50 100 150 KM

SOURCE:
Information provided
by SCS Snow Survey
Personnel

USDA SCS FORT WORTH, TEXAS 76105

JUNE 1986 4-R-39296

GENERAL OUTLOOK

SUMMARY:

Snowpacks in the northern two-thirds of the state are well below average while those in the southern drainages are generally near to a little below average. Considerable melt at low and mid-elevations in April combined with below average mountain precipitation has caused snowpacks to deteriorate in most areas that were already below average. Areas that were near average last month generally had near to above average mountain precipitation and maintained snowpacks near April 1 levels. Runoff during April was above average for most drainages. Shortages in irrigation water supplies can be expected to develop by late June to early July over most of the state on drainages not having stored water.

SNOWPACK:

Snowpack levels have dropped in most areas because of melt and below average precipitation during April. The northern half of the state has well below average snowpacks. Below average snowpack covers most of the remaining area except for near average conditions in areas near the border in southwest and southern Montana. Snowpack in Wyoming drainages that flow into Montana are generally near to above average.

PRECIPITATION:

Mountain precipitation was only 50 to 80 percent of average in the Kootenai, Flathead, Sun, Teton, Marias, St. Mary and Milk River drainages in April. Most other drainages had near to a little above average April precipitation except for the Jefferson, Madison, and part of the Yellowstone River headwaters where precipitation was above average.

RESERVOIRS:

Most reservoirs west of the Divide have above average levels of storage. East of the Divide, storage in most reservoirs is above average except for below average storage in Swift, Pishkun, Deadman's Basin, Bair, and Tongue which are irrigation reservoirs, and Ennis Lake and Mystic Lake which are hydroelectric projects.

STREAMFLOW:

Runoff during April was above average because of snowmelt and rainfall. May through September runoff is forecast well below average for most streams and rivers in the northern third of Montana, below average for the middle third, and a little below average for most drainages in southwest Montana and those with headwaters near the Montana-Wyoming border or in Wyoming. Shortages in irrigation water supplies can be expected on most drainages in the northern two-thirds of the State by late June to early July. Those with headwaters near or in Wyoming can look for a little below but generally adequate irrigation supplies.

PEAK FLOWS:

Peak snowmelt flows are predicted to be below average on all Columbia River drainage streams and should occur near or soon after mid-May. Some low elevation streams have already peaked. In the Missouri River basin, peaks are forecast a little below average from Missouri headwater streams and below average on downstream tributaries. Streams in the headwaters are expected to peak in late May while downstream tributaries may peak a little earlier. The Yellowstone River and its tributaries are forecast to peak at about average levels and reach their peak snowmelt runoff in early June.

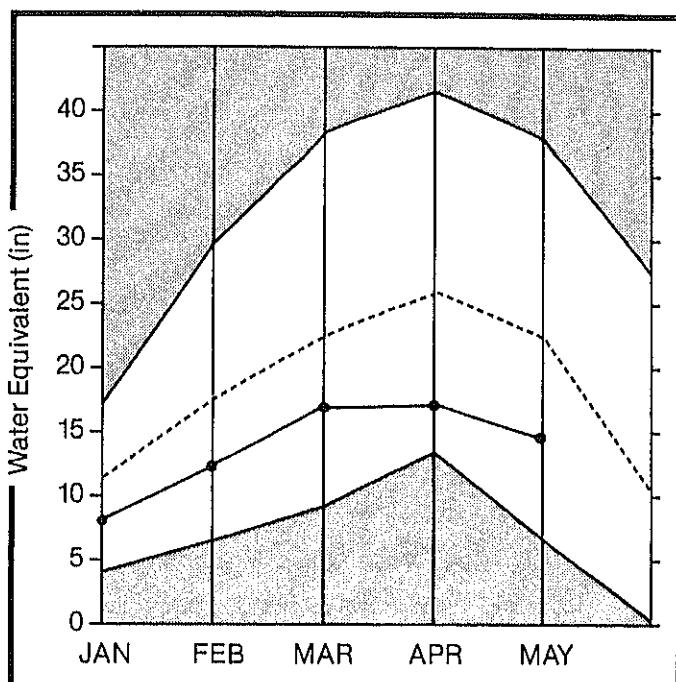
NOTICE

The printer published the February 1, 1986 Mountain Snow Water Equivalent Map on page 27 of the April 1, 1986 Water Supply Outlook. We apologize for any inconvenience this may have caused. If you need the correct April 1 Mountain Snow Water Equivalent Map, let us know and we will be happy to send a copy. Write or call us at the following address and phone:

SCS-Snow Surveys
Room 443, Federal Building
10 East Babcock St.
Bozeman, MT 59715
Commercial: (406)587-6843
FTS: 585-4843

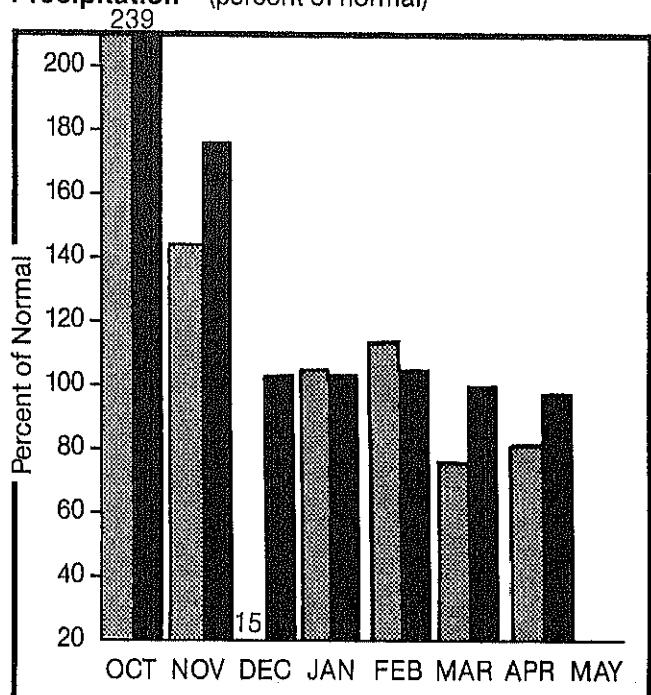
Kootenai Basin

Mountain snowpack* (inches)



* Kootenai in Montana

Precipitation* (percent of normal)



*Based on selected stations

Maximum

Average



Minimum

Current

Monthly precipitation

Year to date precipitation

WATER SUPPLY OUTLOOK:

Snowpack percentages continue to deteriorate in the Montana drainages and remain well below average. Snow in Canada is a little better but still below average. April precipitation was about 80 percent of average in mountain areas. April runoff was above average. Streamflows are forecast well below average on smaller tributaries and a little better for the Kootenai River.

For more information contact your local Soil Conservation Service office.

KOOTENAI RIVER BASIN in Montana

STREAMFLOW FORECASTS

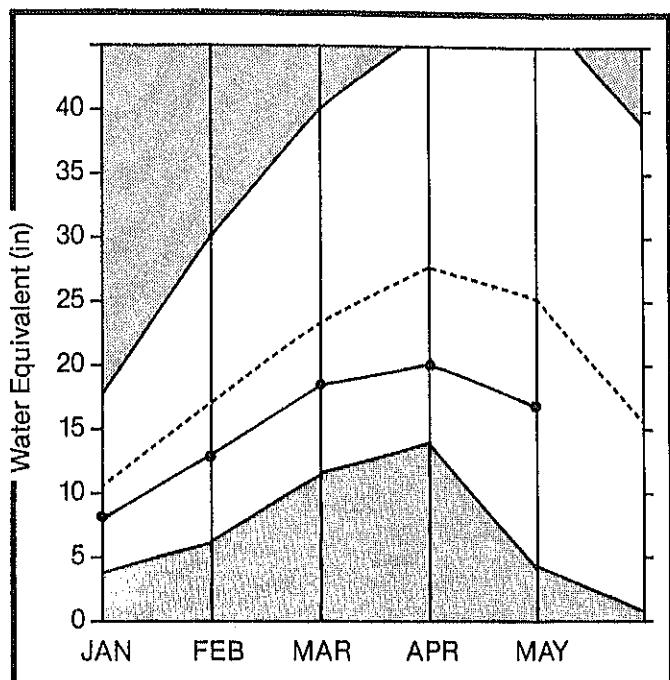
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOH FLOW (CFS)	LOH DATE
KOOTENAI RIVER b/w Libby Dam *	MAY-JUL	5569.0	4760.0	85	100	70				
	MAY-SEP	6590.0	5720.0	86	100	74				
FISHER RIVER near Libby	MAY-JUL	178.0	98.0	55	84	26				
	MAY-SEP	194.0	109.0	56	85	27				
YAAK RIVER near Troy	MAY-JUL	395.0	240.0	60	85	37				
	MAY-SEP	418.0	253.0	60	84	37				
KOOTENAI RIVER at Leonia *	MAY-JUL	6734.0	5320.0	79	99	59				
	MAY-SEP	7838.0	6250.0	79	99	61				
	MAY-JUN	5288.0	4175.0	78	100	58				

RESERVOIR	RESERVOIR STORAGE (1000AF)				WATERSHED SNOWPACK ANALYSIS				
	USEABLE CAPACITY	USEABLE STORAGE **			WATERSHED	NO. COURSES	THIS YEAR AS % OF		
		THIS YEAR	LAST YEAR	AVE.			AVE.D	LAST YR.	AVERAGE
LAKE KOOCANUSA	5748.0	2583.0	2167.0	1864.0	EAST KOOTENAI in B.C.	22	98	83	
					KOOTENAI in MONTANA	31	65	56	
					KOOTENAI ab BONNERS FERRY	53	75	65	

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

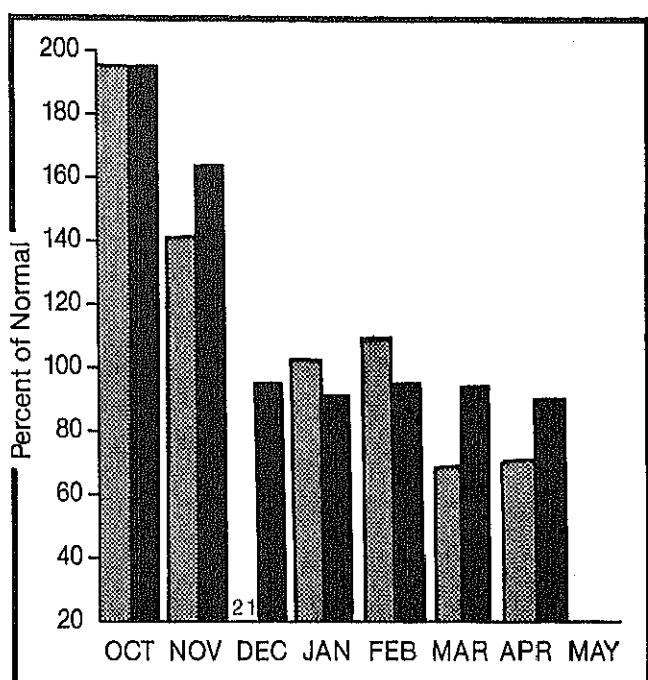
Flathead Basin

Mountain snowpack* (inches)



* Flathead

Precipitation* (percent of normal)



*Based on selected stations

Maximum [Solid Line Pattern]

Average [Dashed Line Pattern]

Minimum [Dotted Line Pattern]

Current [Solid Line with Dots]

Monthly precipitation [Diagonal Lines Pattern]

Year to date precipitation [Vertical Bars Pattern]

WATER SUPPLY OUTLOOK:

Snowpack deteriorated in most drainages during April. Some increase in water content was noted at higher elevation sites but most locations showed considerable melt. Mountain precipitation was also below average in April. Runoff was above average last month. May through September streamflows are forecast to be below average in all drainages.

For more information contact your local Soil Conservation Service office.

FLATHEAD RIVER BASIN

STREAMFLOW FORECASTS

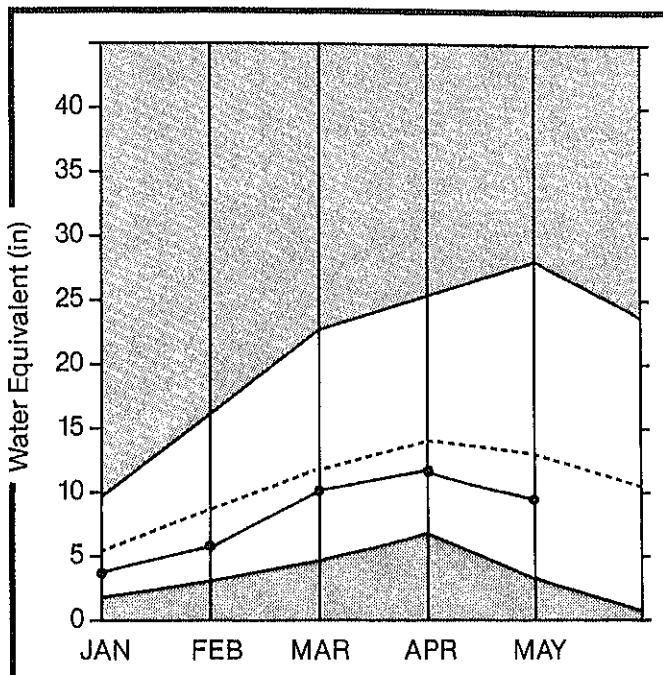
FORECAST POINT	FORECAST PERIOD	Z0 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
NF FLATHEAD near Columbia Falls	MAY-JUL	1562.0	1060.0	67	85	51				
	MAY-SEP	1742.0	1210.0	69	86	52				
	MAY-JUN	1301.0	885.0	68	84	52				
MF FLATHEAD near West Glacier	MAY-JUL	1546.0	1050.0	67	87	49				
	MAY-SEP	1702.0	1170.0	68	87	51				
	MAY-JUN	1287.0	875.0	67	86	50				
SF FLATHEAD near Columbia Falls *	MAY-JUL	1893.0	1380.0	72	90	56				
	MAY-SEP	2029.0	1500.0	73	90	58				
	MAY-JUN	1636.0	1195.0	73	95	51				
FLATHEAD near Columbia Falls *	MAY-JUL	5117.0	3480.0	68	85	51				
	MAY-SEP	5604.0	3900.0	69	86	54				
	MAY-JUN	4317.0	2975.0	68	88	50				
SWAN RIVER near Big Fork	MAY-JUL	514.0	405.0	78	97	61				
	MAY-SEP	599.0	483.0	80	99	63				
FLATHEAD RIVER near Polson *	MAY-JUL	5956.0	4190.0	70	86	54				
	MAY-SEP	6522.0	4620.0	70	89	53				
	MAY-JUN	5002.0	3500.0	69	89	51				

RESERVOIR	RESERVOIR STORAGE (1000AF)			WATERSHED SNOWPACK ANALYSIS				
	USEABLE CAPACITY 	** USEABLE STORAGE **			WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE	
		THIS YEAR 	LAST YEAR 	AVE. 				
CAMAS (4)	45.2	36.0	26.2	27.9	NORTH FORK FLATHEAD	14	68	63
MISSION VALLEY (8)	100.0	61.5	43.4	49.3	MIDDLE FORK FLATHEAD	11	74	67
HUNGRY HORSE	3451.0	2729.0	2067.0	1982.0	SOUTH FORK FLATHEAD	11	80	74
FLATHEAD LAKE	1791.0	944.8	845.0	932.7	STILLWATER-WHITEFISH	9	69	58
					SWAN	10	84	74
					LITTLE BITTERROOT	6	76	42
					FLATHEAD	41	76	67

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

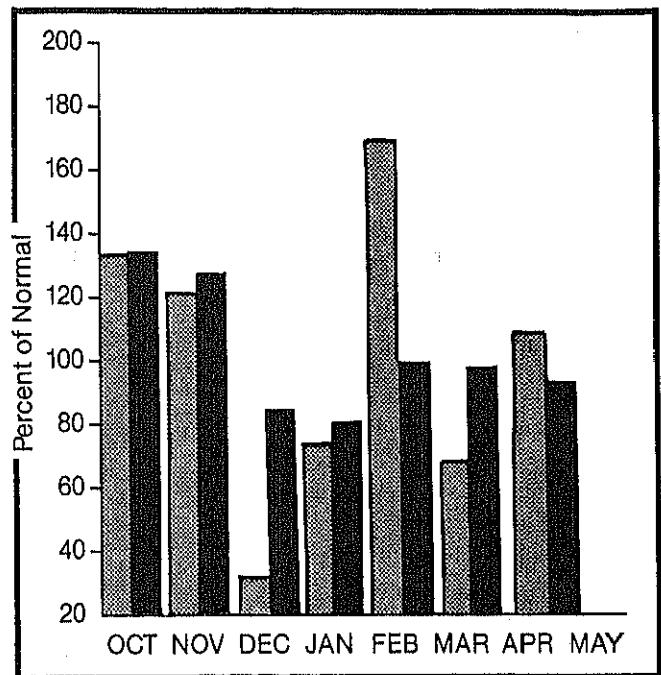
Clark Fork Basin above Missoula

Mountain snowpack* (inches)



* Clark Fork above Missoula

Precipitation* (percent of normal)



*Based on selected stations

Legend:

- Maximum [Shaded Box]
- Average [Dashed Line]
- Minimum [Solid Box]
- Current [Dotted Line with dots]
- Monthly precipitation [Vertical Bar]
- Year to date precipitation [Diagonal Line]

WATER SUPPLY OUTLOOK:

April precipitation was a little above average in mountain areas. Also, considerable melt occurred at low and mid-elevations reducing the already low snowpacks even further. April runoff was above average. Streamflows this summer are forecast below average for all drainages. Shortages in irrigation supplies are expected by late June or early July.

For more information contact your local Soil Conservation Service office.

CLARK FORK RIVER BASIN above Missoula

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST FROEABLE (1000AF)	MOST PROBABLE (%) AVE.)	REAS. MAX. (%) AVE.)	REAS. MIN. (%) AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
AGULTON RESERVOIR Inflow (MG)*	MAY-JUL	223.0	155.0	69	95	44				
	MAY-JUN	197.0	140.0	71	96	46				
WARM SPRINGS at Meyers Dam *	MAY-JUL	35.3	28.5	80	105	57				
	MAY-SEP	44.0	36.0	81	107	57				
FLINT CREEK near Southern Cross *	MAY-JUL	13.0	10.4	80	115	46				
	MAY-SEP	16.0	12.8	80	113	44				
FLINT CREEK below Boulder Creek *	MAY-JUL	52.0	42.8	82	117	48				
	MAY-SEP	68.0	56.2	82	118	47				
LOWER WILLOW CR RES Inflow *	MAY-JUL	12.4	7.8	62	97	24				
	MAY-SEP	13.2	8.5	64	98	30				
N. FK. ROCK CRK near Philipsburg	MAY-JUL	66.0	54.4	82	106	59				
	MAY-SEP	74.0	61.0	82	105	59				
NEVADA CREEK near Firth	MAY-JUL	17.0	9.8	57	94	24				
	MAY-SEP	19.0	11.0	57	95	21				
BLACKFOOT RIVER near Bonner	MAY-JUL	786.0	490.0	62	83	45				
	MAY-SEP	881.0	575.0	65	83	47				
	MAY-JUN	664.0	425.0	64	82	46				
CLARK FORK RIVER above Milltown *	MAY-JUL	601.0	450.0	74	110	40				
	MAY-SEP	709.0	540.0	76	111	41				
	MAY-JUN	490.0	368.0	75	110	40				
CLARK FORK RIVER above Missoula	MAY-JUL	1387.0	940.0	67	93	43				
	MAY-SEP	1590.0	1120.0	70	95	45				
	MAY-JUN	1154.0	790.0	68	94	44				

RESERVOIR STORAGE (1000AF)

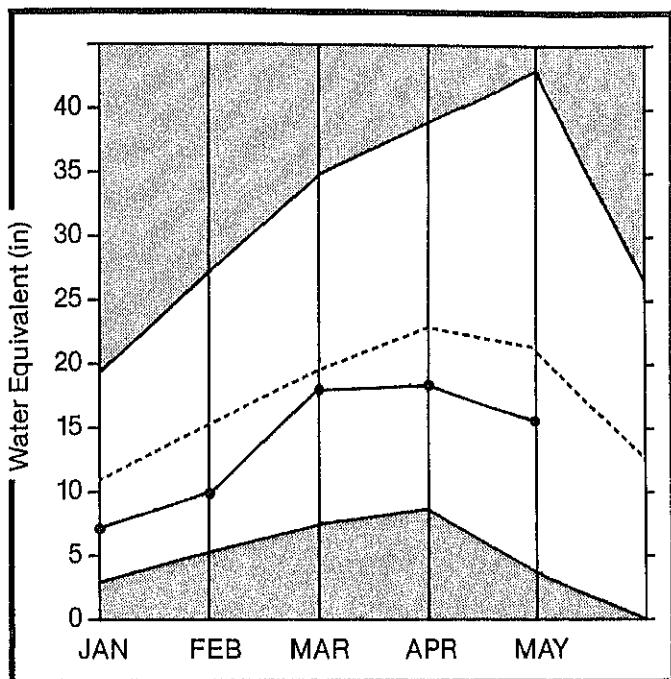
WATERSHED SNOWPACK ANALYSIS

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **	WATERSHED	NO. COURSES	THIS YEAR AS % OF
	1 YEAR	LAST YEAR AVE.		AVE.D	LAST YR. AVERAGE
GEORGETOWN LAKE	31.0	27.1	26.0	23.7	CLARK FORK ab BLACKFOOT 43 119 77
LOWER WILLOW CREEK	4.9	5.0	3.1	2.7	BLACKFOOT 21 92 65
NEVADA CREEK	12.6	12.5	9.2	10.2	CLARK FORK above MISSOULA 58 112 74

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

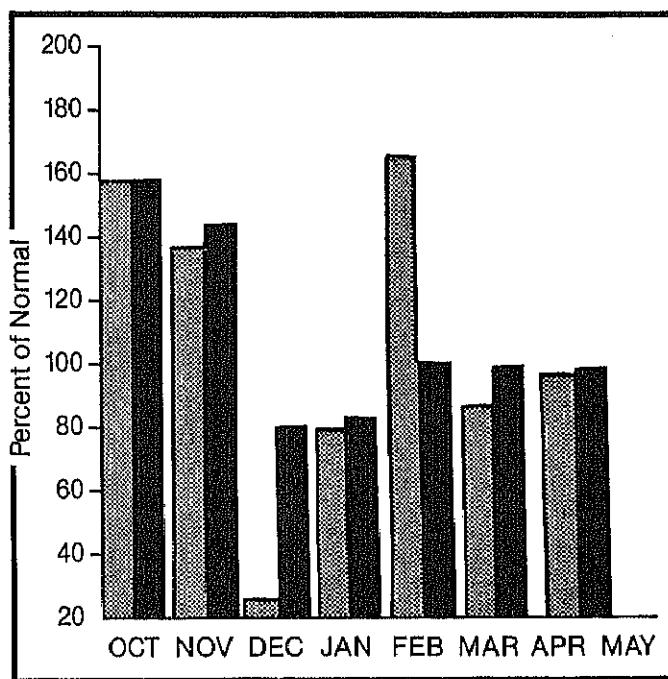
Clark Fork Basin below Missoula

Mountain snowpack* (inches)



*Bitterroot

Precipitation* (percent of normal)



*Based on selected stations

Maximum



Average



Minimum



Current



Monthly precipitation



Year to date precipitation

WATER SUPPLY OUTLOOK:

Even though April precipitation was near average in the mountains, melt at low and mid-elevations has reduced snowpack levels. April runoff was above average. May through September runoff is forecast to be below average. Shortages in irrigation water supplies can be expected by late June on smaller drainages and by early to mid-July on the larger streams.

For more information contact your local Soil Conservation Service office.

CLARK FORK RIVER BASIN below Missoula

STREAMFLOW FORECASTS

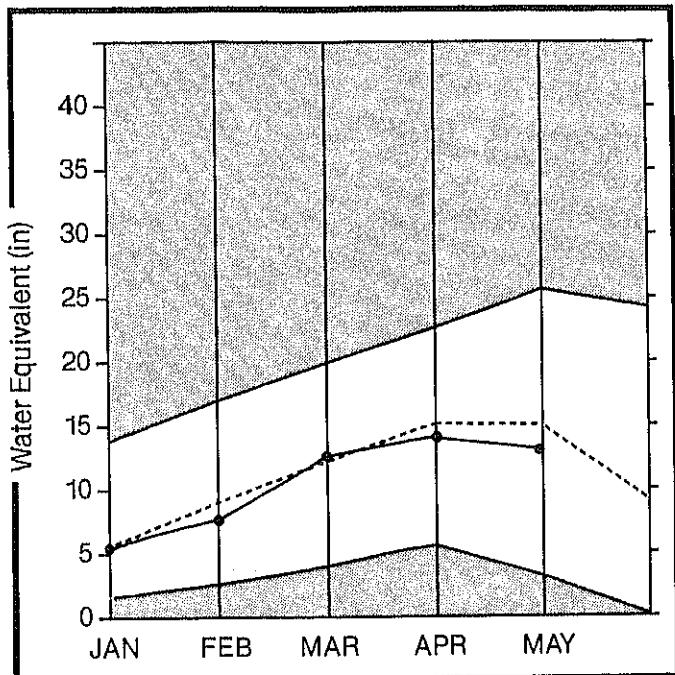
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
CLARK FORK RIVER above Missoula	MAY-JUL	1387.0	940.0	67	93	43				
	MAY-SEP	1590.0	1120.0	70	95	45				
	MAY-JUN	1154.0	790.0	68	94	44				
W. F. BITTERROOT RIVER nr Conner *	MAY-JUL	146.0	113.0	77	103	53				
	MAY-SEP	160.0	122.0	76	101	51				
BITTERROOT RIVER near Darby	MAY-JUL	476.0	366.0	76	102	52				
	MAY-SEP	524.0	403.0	76	100	54				
	MAY-JUN	408.0	315.0	77	101	53				
SKALKAHO CREEK near Hamilton	MAY-JUL	46.0	38.0	82	96	70				
	MAY-SEP	53.0	43.5	82	94	70				
BURNT FORK CR nr Stevensville *	MAY-JUL	30.0	23.8	79	110	50				
	MAY-SEP	35.0	27.5	78	103	54				
BITTERROOT RIVER at Missoula *	MAY-JUL	1238.0	959.0	77	93	61				
	MAY-SEP	1358.0	1070.0	78	95	63				
	MAY-JUN	1046.0	825.0	78	96	62				
CLARK FORK RIVER below Missoula	MAY-JUL	2625.0	1900.0	72	90	54				
	MAY-SEP	2948.0	2190.0	74	92	56				
	MAY-JUN	2200.0	1615.0	73	92	54				
CLARK FORK RIVER at St. Regis	MAY-JUL	3451.0	2360.0	68	88	48				
	MAY-SEP	3880.0	2740.0	70	91	51				
	MAY-JUN	2896.0	2020.0	69	94	46				
CLARK FORK RIVER near Plains *	MAY-JUL	9739.0	6430.0	66	82	50				
	MAY-SEP	10821.0	7240.0	66	83	51				
	MAY-JUN	8127.0	5405.0	66	82	52				
THOMPSON RIVER near Thompson Falls	MAY-JUL	189.0	120.0	63	87	40				
	MAY-SEP	217.0	140.0	64	86	43				
PROSPECT CREEK at Thompson Falls	MAY-JUL	104.0	75.0	72	91	53				
	MAY-SEP	113.0	85.0	75	93	58				
CLARK FORK at Whitehorse Rapids *	MAY-JUL	10711.0	7040.0	65	80	52				
	MAY-SEP	11935.0	7920.0	66	79	53				
	MAY-JUN	8930.0	5894.0	66	79	53				

RESERVOIR	RESERVOIR STORAGE (1000AF)			WATERSHED SNOWPACK ANALYSIS					
	USEABLE CAPACITY	xx USEABLE STORAGE xx	THIS YEAR	LAST YEAR	AVE.	WATERSHED	NO. COURSES AVE.0	THIS YEAR AS % OF LAST YR.	AVERAGE
PAINTED ROCKS LAKE		NO REPORT				CLARK FORK above MISSOULA	58	112	74
NOXON RAPIDS	335.0	328.5	138.0	250.1		BITTERROOT	21	94	72
COMO	34.9	28.4	20.4	18.1		LWR CLARK FK b/w MISSOULA	18	72	65
						BITTERROOT & LWR C.F.	38	81	69
						CLARK FORK TOTAL	90	91	70
						FLATHEAD	41	76	67
						PEND O'REILLE	126	84	69

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

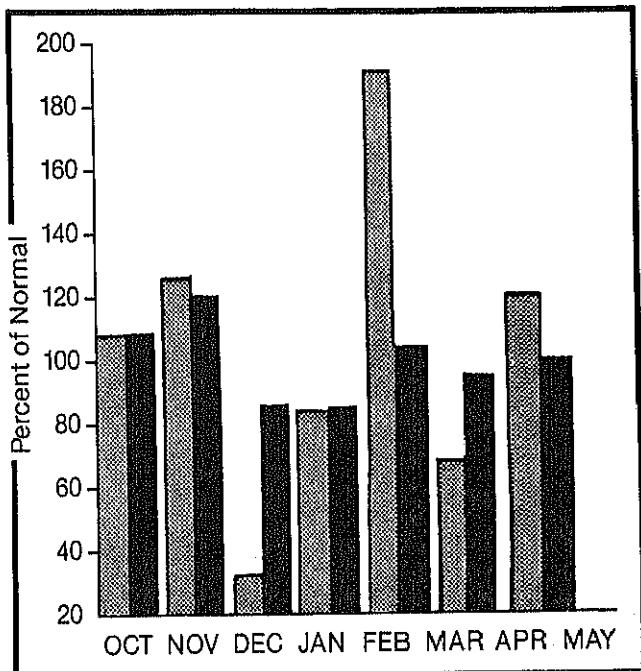
Jefferson Basin

Mountain snowpack* (inches)



* Jefferson

Precipitation* (percent of normal)



*Based on selected stations

Maximum

Average



Minimum

Current

Monthly precipitation

Year to date precipitation

WATER SUPPLY OUTLOOK:

Above average mountain precipitation fell in April. Melt at low and mid-elevations has left snowpacks at about the same level as a month ago. April runoff was above average. May through September runoff is forecast to be a little below average on most drainages. Irrigation water supplies should be average or a little below average.

For more information contact your local Soil Conservation Service office.

JEFFERSON RIVER BASIN

STREAMFLOW FORECASTS

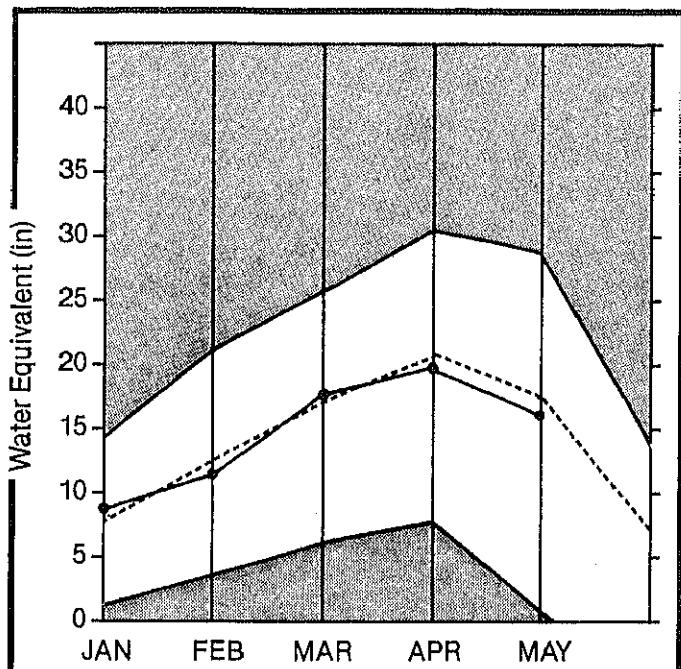
FORECAST POINT	FORECAST PERIOD	20 YR, AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
RED ROCK RIVER near Monida *	MAY-JUL	73.5	65.0	88	129	48				
	MAY-SEP	80.7	72.0	89	131	47				
BEAVERHEAD RIVER near Grant *	MAY-JUL	99.0	89.0	89	130	49				
	MAY-SEP	120.0	107.0	89	129	49				
BEAVERHEAD RIVER at Barratts *	MAY-JUL	134.0	120.0	89	130	49				
	MAY-SEP	162.0	145.0	89	130	49				
RUBY RIVER near Alder	MAY-JUL	75.0	66.0	88	111	67				
	MAY-SEP	92.0	80.0	86	111	63				
BIG HOLE RIVER near Melrose	MAY-JUL	614.0	525.0	85	115	56				
	MAY-SEP	674.0	577.0	85	116	56				
WILLOW CREEK near Harrison	MAY-JUL	15.3	13.0	84	124	46				
	MAY-SEP	17.5	15.0	85	126	46				

RESERVOIR STORAGE (1000AF)				WATERSHED SNOWPACK ANALYSIS				
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **	HATERSHED	NO. COURSES	THIS YEAR AS % OF	AVE.D	LAST YR.	AVERAGE
LIMA	84.0	67.2	67.6	54.7	BEAVERHEAD	28	163	99
CLARK CANYON	255.6	164.8	163.3	157.5	RUBY	13	135	89
RUBY RIVER	38.8	40.1	37.8	35.2	BIGHOLE	28	131	89
					BOULDER	14	127	67
					JEFFERSON	65	141	88

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

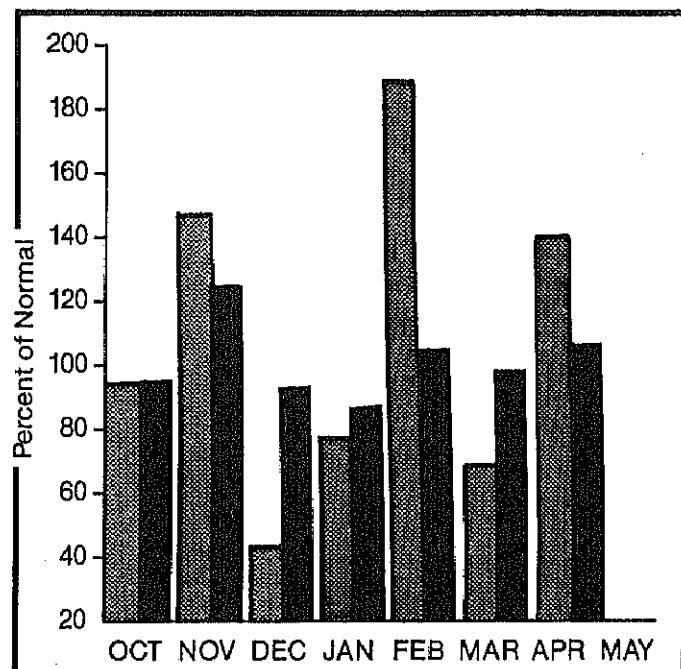
Madison Basin

Mountain snowpack* (inches)



* Madison

Precipitation* (percent of normal)



*Based on selected stations

Legend:

- Maximum
- Average
- Minimum
- Current
- Monthly precipitation
- Year to date precipitation

WATER SUPPLY OUTLOOK:

Mountain precipitation was well above average in April. Lower elevation snowpacks had some melt during the past month, producing above average runoff. May through September runoff is forecast near average on the Madison. However, runoff from streams flowing into the lower Madison is expected to be below average.

For more information contact your local Soil Conservation Service office.

MADISON RIVER BASIN

STREAMFLOW FORECASTS

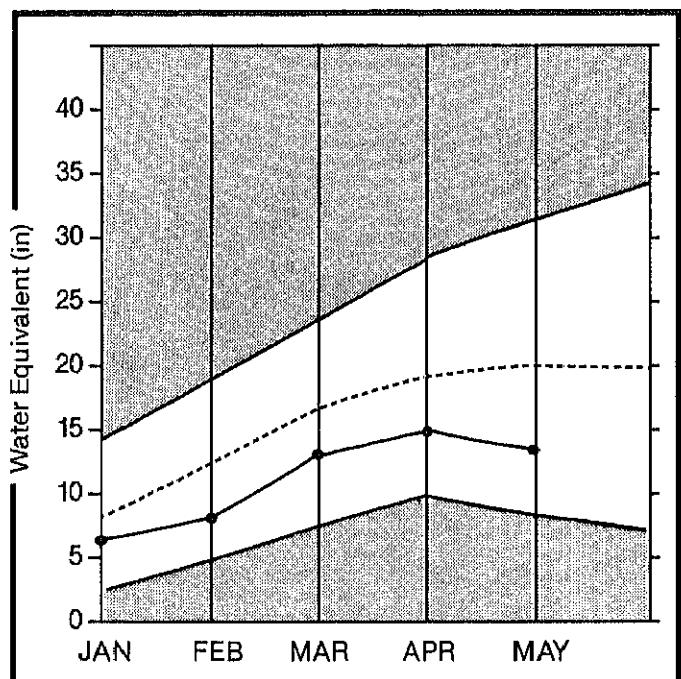
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (%) AVE.)	REAS. MAX. (%) AVE.)	REAS. MIN. (%) AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
MADISON RIVER near Grayling *	MAY-JUL	332.0	354.0	106	125	89				
	MAY-SEP	440.0	470.0	106	122	92				

RESERVOIR STORAGE (1000AF)				WATERSHED SNOWPACK ANALYSIS				
RESERVOIR	USEABLE CAPACITY	xx USEABLE STORAGE xx		WATERSHED	NO. COURSES	THIS YEAR AS % OF		
	1 YEAR	LAST YEAR	AVE.		AVE.D	LAST YR.	AVERAGE	
ENNIS LAKE	41.0	33.0	30.3	36.3	13	141	103	
HEBGEN LAKE	377.5	289.3	289.6	229.7	19	136	80	
				MADISON	32	138	89	

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1981-80 period.

Gallatin Basin

Mountain snowpack* (inches)

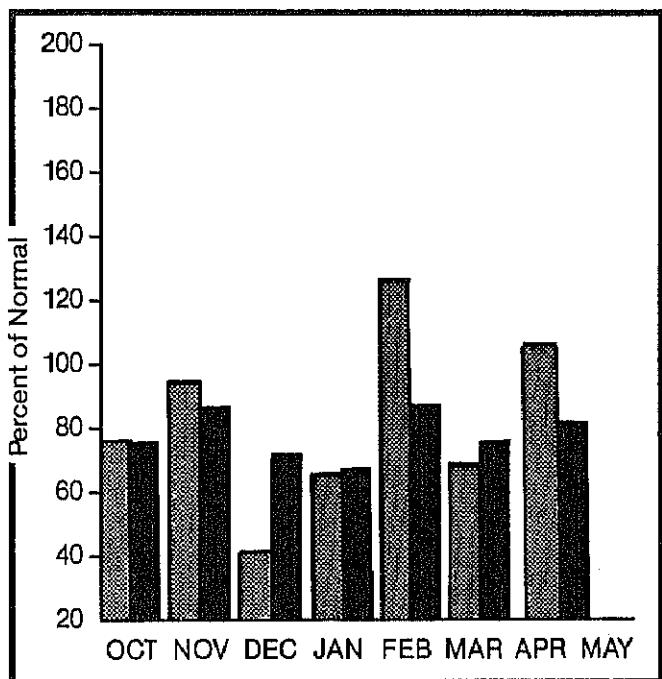


*Gallatin

Maximum Average

Minimum Current

Precipitation* (percent of normal)



*Based on selected stations



Monthly precipitation



Year to date precipitation

WATER SUPPLY OUTLOOK:

Mountain precipitation during April was about average. However, melt at lower elevations has left snowpacks below average in the upper Gallatin and well below average in the lower tributaries. April runoff was above average. Streamflows for May through September are forecast below average on all drainages. Shortages of irrigation water supplies can be expected by early July.

For more information contact your local Soil Conservation Service office.

GALLATIN RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	HIST. PROBABLE (1000AF)	MOST PROBABLE (%) AVE.	REAS. MAX. (%) AVE.	REAS. MIN. (%) AVE.	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
GALLATIN RIVER near Gateway	MAY-JUL	433.0	325.0	75	90	60				
	MAY-SEP	514.0	385.0	74	93	57				
E & W FK, HYALITE CRK at Bozeman *	MAY-JUL	22.4	17.5	78	94	63				
	MAY-SEP	26.2	20.7	79	95	61				
HYALITE CREEK near Bozeman *	MAY-JUL	35.9	27.3	76	100	53				
	MAY-SEP	42.0	32.3	76	100	55				
GALLATIN RIVER at Logan	MAY-JUL	452.0	300.0	66	94	38				
	MAY-SEP	541.0	362.0	66	93	41				

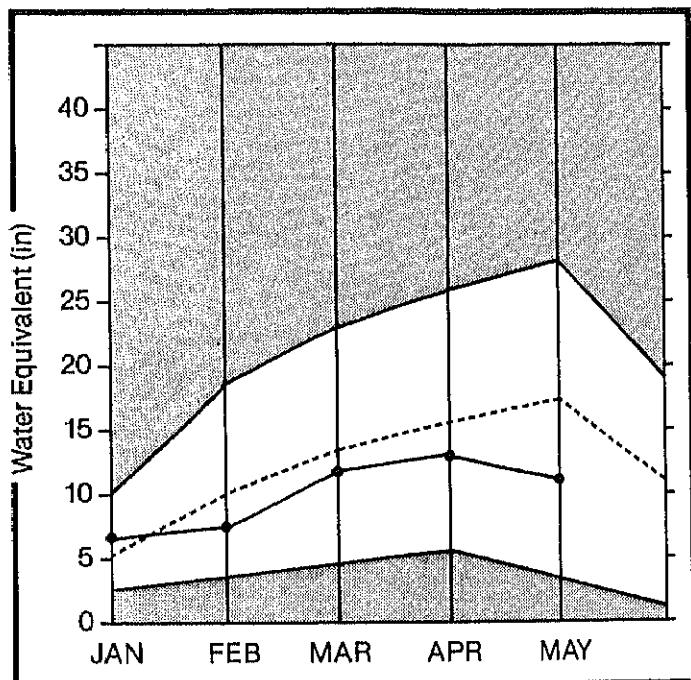
RESERVOIR STORAGE (1000AF) | WATERSHED SNOWPACK ANALYSIS

RESERVOIR	USEABLE CAPACITY	xx USEABLE STORAGE xx	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE
	1 YEAR	LAST YEAR AVE.			
MIDDLE CREEK	8.0	6.8	UPPER GALLATIN	13	129 78
			EAST GALLATIN	12	100 58
			GALLATIN	22	115 67

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

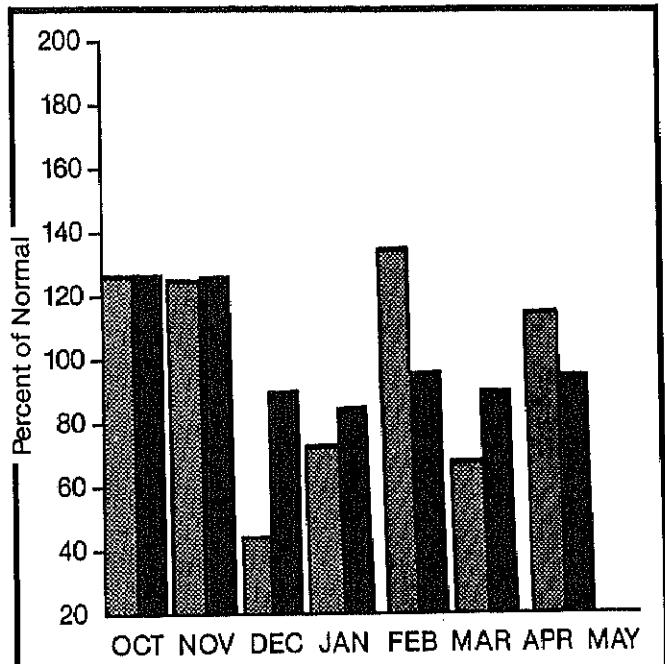
Missouri Basin

Mountain snowpack* (inches)



*Missouri Toston to Fort Peck

Precipitation* (percent of normal)



*Based on selected stations

Maximum



Average



Minimum



Current



Monthly precipitation



Year to date precipitation



WATER SUPPLY OUTLOOK:

Snowpack conditions deteriorated during April because of melt even though mountain precipitation was a little above average. April runoff was above average. Spring and summer streamflows are forecast below average on most drainages. Shortages in irrigation water supplies can be expected to start developing by late June or early July.

For more information contact your local Soil Conservation Service office.

MISSOURI RIVER BASIN

STREAMFLOW FORECASTS

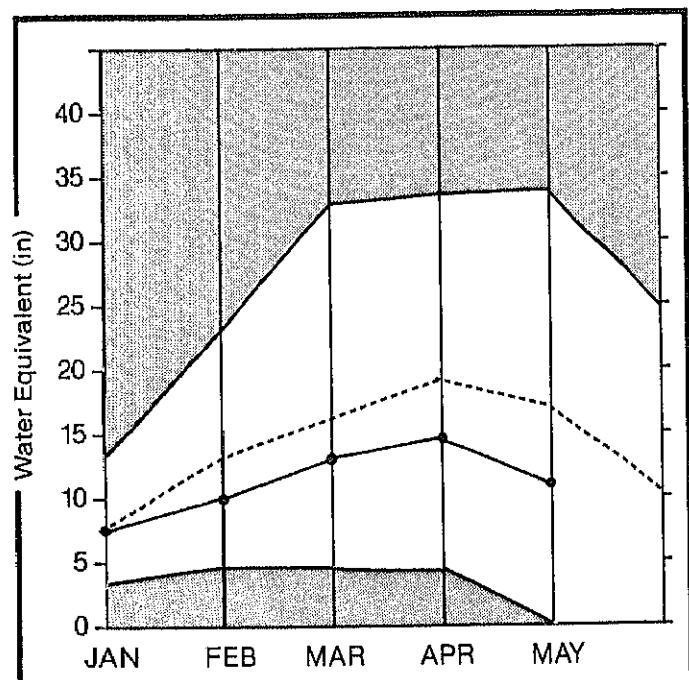
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
MISSOURI RIVER at Toston *	MAY-JUL	1849.0	1570.0	84	118	60				
	MAY-SEP	2200.0	1864.0	84	118	60				
SHEEP CREEK nr White Sulphur Spgs.	MAY-JUL	17.4	14.5	83	115	52				
	MAY-SEP	20.2	17.0	84	114	54				
BELT CREEK near Monarch	MAY-JUL	114.0	89.0	78	112	44				
	MAY-SEP	126.0	99.0	78	110	47				
MISSOURI RIVER at Fort Benton *	MAY-JUL	2928.0	2345.0	80	120	52				
	MAY-SEP	3440.0	2796.0	81	121	52				
MISSOURI RIVER at Virgelle *	MAY-JUL	3418.0	2735.0	80	123	50				
	MAY-SEP	3960.0	3144.0	79	123	49				
MISSOURI RIVER near Landusky *	MAY-JUL	3707.0	2970.0	80	126	48				
	MAY-SEP	4303.0	3348.0	77	123	47				
N.F. MUSSELSHELL near Delpine	MAY-JUL	4.3	3.8	88	140	47				
	MAY-SEP	5.3	4.7	88	132	38				
S.F. MUSSELSHELL above Martinsdale	MAY-JUL	52.7	45.9	87	127	47				
	MAY-SEP	56.5	48.2	85	127	42				
MISSOURI RIVER below Fort Peck *	MAY-JUL	3711.0	2930.0	78	131	46				
	MAY-SEP	4244.0	3300.0	77	129	43				
LAKE SAKAKAWEA Inflow *	MAY-JUL	9708.0	8925.0	91	135	65				
	MAY-SEP	10855.0	10204.0	94	137	64				

RESERVOIR	RESERVOIR STORAGE (1000AF)				WATERSHED SNOWPACK ANALYSIS			
	USEABLE CAPACITY	xx USEABLE STORAGE xx			WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF	
		THIS YEAR	LAST YEAR	AVE.			LAST YR.	AVERAGE
CANYON FERRY LAKE	2043.0	1540.0	1536.0	1499.0	MISSOURI HEADWATERS	104	134	84
HELENA VALLEY	9.2	8.4	7.7	7.6	WEST SIDE MISSOURI	11	94	61
LAKE HELENA	10.4	10.9	10.9	9.8	SMITH-BELT	11	103	74
HAUSER & HELENA	61.9	63.0	63.0	59.3	MISSOURI MAINSTEM	22	99	69
HOLTER LAKE	81.9	80.5	74.9	70.8	SUN-TETON-MARIAS	16	72	61
SMITH RIVER	10.6	10.5	11.5	9.1	JUDITH-MUSSELSHELL	17	87	65
NEWLAN CREEK	12.4	11.2	9.8	9.1	MISSOURI above FORT PECK	144	116	78
BAIR	7.0	4.3	3.2	6.2	MILK HEADWATERS	4	36	38
MARTINSDALE	23.1	19.7	8.1	12.1	BEAR PAW	6	0	0
DEADMAN'S BASIN	72.2	44.4	54.0	54.3	MILK RIVER	10	35	31
FORT PECK LAKE	18.9	14.4	15.6	15.2	MISSOURI in MONTANA	152	115	77
					MISSOURI b/w YELLOWSTONE	252	137	87

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1981-80 period.

Sun, Teton and Marias Basins

Mountain snowpack* (inches)



*Sun-Teton-Marias

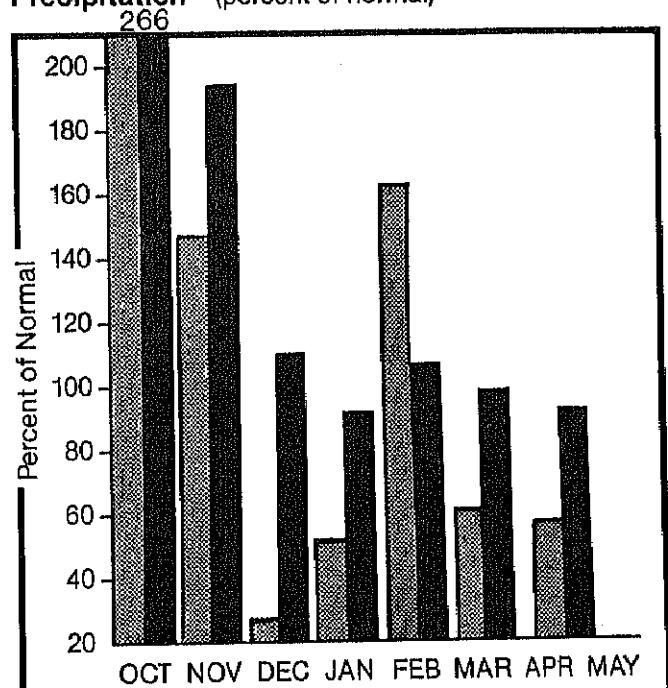
Maximum

Average

Minimum

Current

Precipitation* (percent of normal)



*Based on selected stations



Monthly precipitation



Year-to-date precipitation

WATER SUPPLY OUTLOOK†

Snowpack conditions continue to deteriorate because of melt at low and mid-elevations. Mountain precipitation was well below average in April but runoff was near to above average. May through September runoff is forecast well below average on all drainages. Irrigation water shortages can be expected by late June on most streams not having stored water.

For more information contact your local Soil Conservation Service office.

SUN-TETON-MARIAS RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE, (1000AF)	HST PROBABLE (1000AF)	HST PROBABLE (% AVE.)	REAS, MAX, (% AVE.)	REAS, MIN, (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SUN RIVER at Gibson Dam *	MAY-JUL	489.0	335.0	68	93	44				
	MAY-SEP	538.0	373.0	69	93	45				
TWO MEDICINE CREEK near Browning *	MAY-JUL	210.0	144.0	68	107	30				
	MAY-SEP	222.0	159.0	68	105	33				
BADGER CREEK near Browning	MAY-JUL	103.0	77.5	75	114	37				
	MAY-SEP	120.0	92.0	76	112	42				
SWIFT RESERVOIR Inflow nr Dupuyer	MAY-JUL	67.7	52.0	76	115	38				
	MAY-SEP	79.7	62.0	77	114	41				
CUT BANK CREEK at Cut Bank	MAY-JUL	98.0	63.0	64	102	27				
	MAY-SEP	104.0	70.0	67	103	32				
MARIAS RIVER near Shelby	MAY-JUL	449.0	295.0	65	104	28				
	MAY-SEP	473.0	320.0	67	104	32				

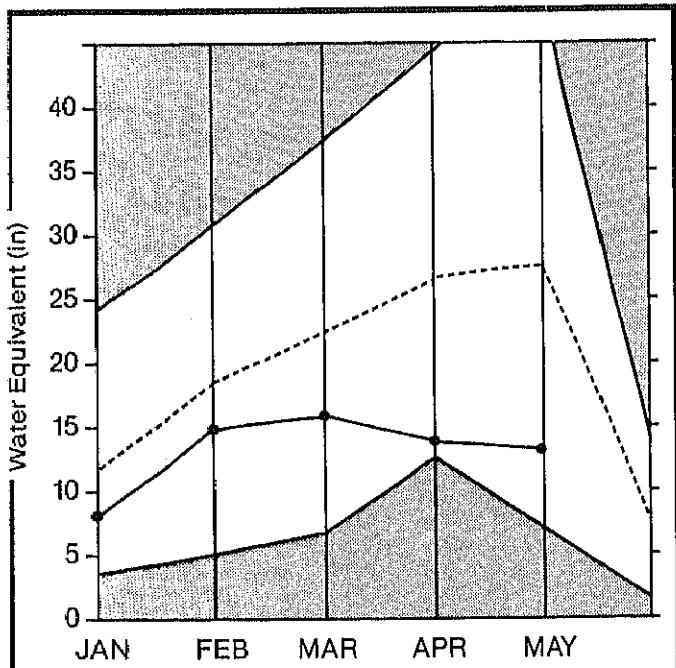
RESERVOIR STORAGE (1000AF) | MATERSHED SNOWPACK ANALYSIS

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **			WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE
		THIS YEAR	LAST YEAR	AVE.			
GIBSON	99.1	78.6	73.8	50.6	SUN-TETON	11	64
PISHKUN	32.0	21.9	21.5	26.4	MARIAS	6	79
WILLOW CREEK	32.2	31.2	14.2	23.7	SUN-TETON-MARIAS	16	72
LOWER TWO MEDICINE LAKE	NO REPORT						
FOUR HORNS LAKE	NO REPORT						
SHIFT	30.0	14.0	13.7	18.3			
LAKE FRANCES	112.0	103.8	27.6	76.9			
LAKE ELWELL (TIBER)	1347.0	813.1	717.0	569.5			

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

St. Mary and Milk Basins

Mountain snowpack* (inches)

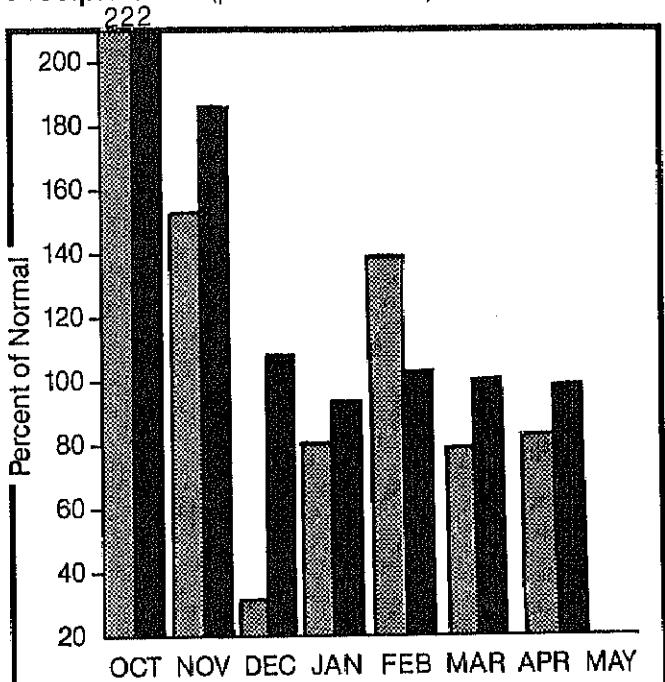


*St. Mary

Maximum Minimum

Average Current

Precipitation* (percent of normal)



*Based on selected stations

WATER SUPPLY OUTLOOK:

Snowpacks continued to deteriorate in April because of melt and below average mountain precipitation. Runoff from May through September is forecast below average on all streams. Irrigation water supplies are expected to be well below average on all streams not having stored water.

For more information contact your local Soil Conservation Service office.

ST. MARY and MILK RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	HIST. PROBABLE (1000AF)	HIST. PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SWIFTCURRENT CREEK at Sherburne *	MAY-JUL	104.0	70.0	67	89	45				
	MAY-SEP	121.0	82.0	67	92	44				
ST. MARY'S RIVER near Babb *	MAY-JUL	394.0	254.0	64	82	46				
	MAY-SEP	465.0	302.0	64	83	47				
MILK RIVER at Eastern Crossing	MAY-SEP	55.4	27.1	48	96	32				
MILK RIVER at Eastern Crossing *	MAY-SEP	199.0	211.0	106	119	102				

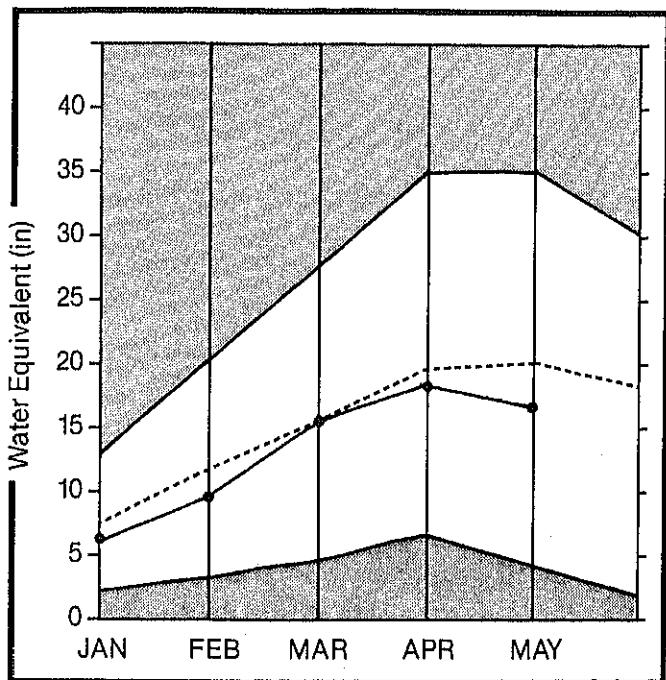
RESERVOIR STORAGE (1000AF) | WATERSHED SNOWPACK ANALYSIS

RESERVOIR	USEABLE CAPACITY!	THIS YEAR	LAST YEAR	AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
LAKE SHERBURNE	64.3	4.9	8.8	21.6	MILK HEADWATERS	4	36	38
FRESNO	127.0	104.6	40.5	103.3	BEAR PAH	6	0	0
BEAVER CREEK	3.5	3.3	1.1	2.6	MILK RIVER	10	35	31
NELSON	66.8	59.9	24.0	43.9	ST. MARY	11	52	48
					ST. MARY and MILK	17	52	46
					BOW RIVER in ALBERTA	11	129	120
					OLDMAN RIVER in ALBERTA	2	81	85

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

Yellowstone Basin

Mountain snowpack* (inches)



* Yellowstone above Big Horn

Maximum



Average



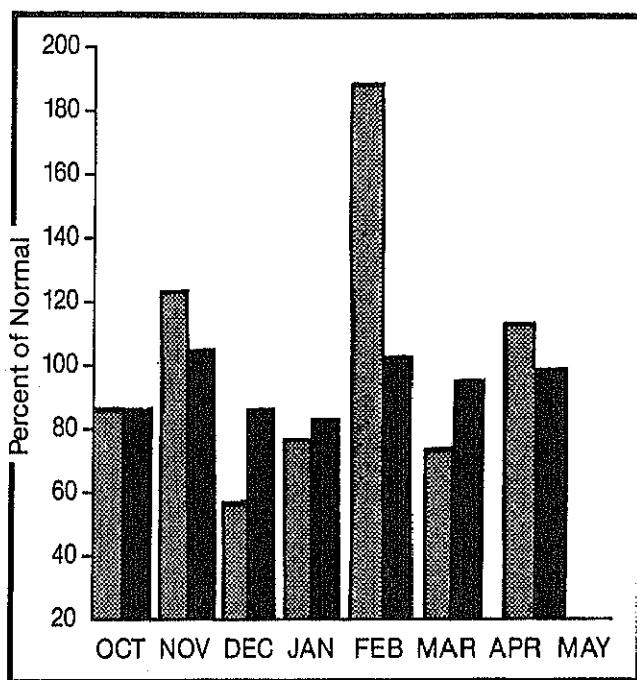
Minimum



Current



Precipitation* (percent of normal)



*Based on selected stations

WATER SUPPLY OUTLOOK:

Snowpack in those drainages in Montana showed some deterioration during April because of melt even though mountain precipitation was a little above average. April runoff was above average. May through September runoff is forecast near to a little below average on most streams. Streams flowing out of the Crazy Mountains are predicted to have below average runoff.

For more information contact your local Soil Conservation Service office.

YELLOWSTONE RIVER BASIN

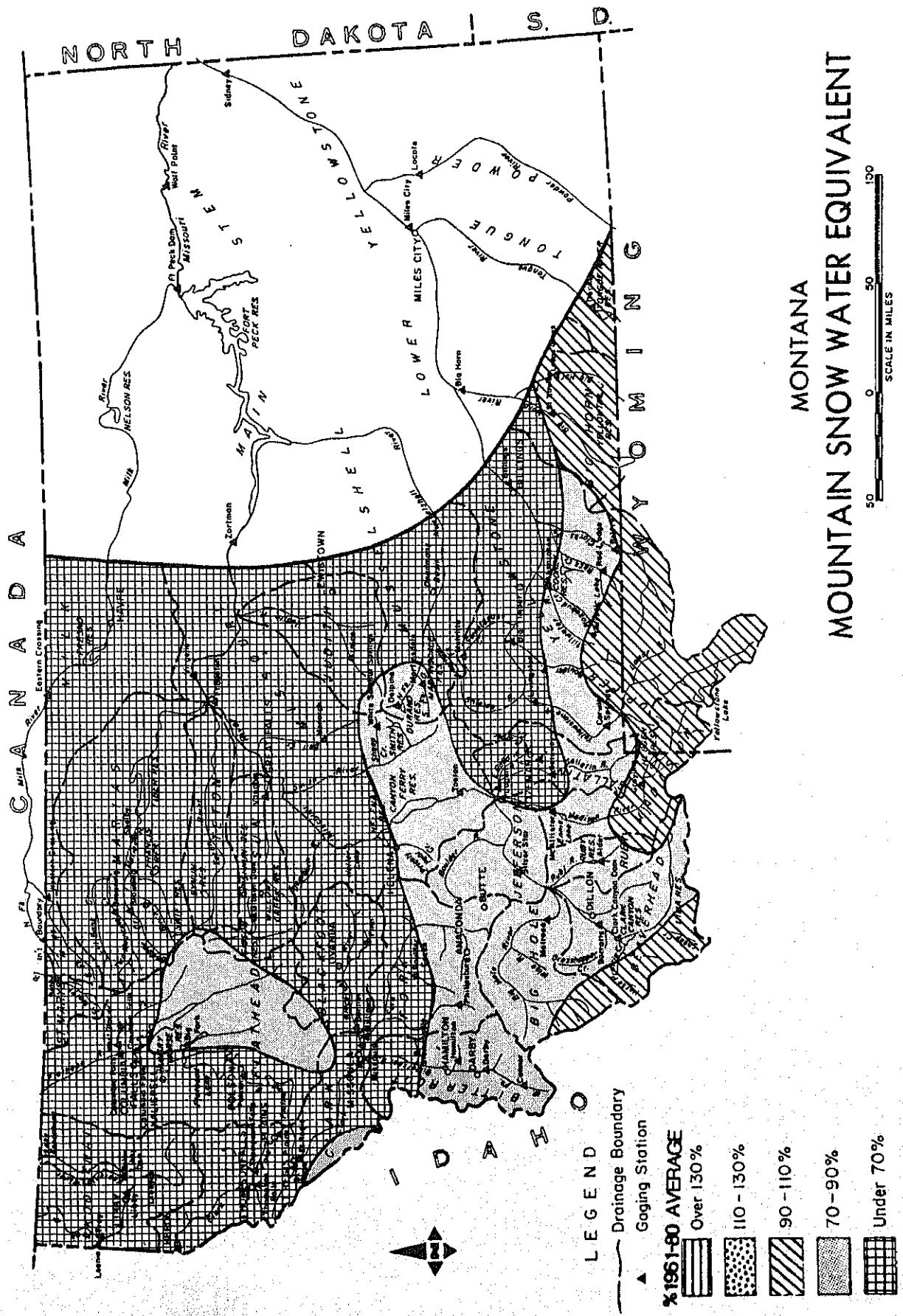
STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	HIST PROBABLE (1000AF)	HIST PROBABLE (% AVE.)	REAS. MAX, (% AVE.)	REAS. MIN, (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
YELLOWSTONE at Lake Outlet	MAY-SEP	790.0	857.0	108	121	96				
YELLOWSTONE at Corwin Springs	MAY-JUL	1602.0	1500.0	93	110	78				
	MAY-SEP	1944.0	1820.0	93	110	78				
YELLOWSTONE near Livingston	MAY-JUL	1860.0	1705.0	91	108	76				
	MAY-SEP	2269.0	2100.0	92	109	77				
BOULDER RIVER at Big Timber	MAY-JUL	353.0	315.0	89	110	68				
	MAY-SEP	385.0	340.0	88	109	67				
STILLWATER RIVER nr Absarokee *	MAY-JUL	502.0	500.0	99	126	74				
	MAY-SEP	606.0	600.0	99	121	77				
CLARKS FORK RIVER near Belfry	MAY-JUL	502.0	575.0	114	133	96				
	MAY-SEP	606.0	667.0	110	129	91				
COONEY RESERVOIR Inflow	MAY-JUL	40.5	31.2	77	106	49				
	MAY-SEP	51.5	40.3	78	103	54				
YELLOWSTONE RIVER at Billings *	MAY-JUL	3571.0	3360.0	94	115	75				
	MAY-SEP	4255.0	3983.0	93	116	75				
BIGHORN RIVER at St. Xavier *	MAY-JUL	1651.0	2300.0	139	179	94				
	MAY-SEP	1833.0	2565.0	139	181	95				
LITTLE BIGHORN RIVER near Hardin	MAY-JUL	137.0	185.0	135	190	89				
	MAY-SEP	157.0	213.0	135	194	94				
TONGUE RIVER at Decker	MAY-JUL	218.0	255.0	116	174	55				
	MAY-SEP	244.0	280.0	114	178	57				
YELLOWSTONE RIVER at Miles City *	MAY-JUL	5391.0	5600.0	103	137	42				
	MAY-SEP	6273.0	6491.0	103	134	74				
POWDER RIVER at Moorehead	MAY-JUL	212.0	235.0	110	175	54				
	MAY-SEP	233.0	262.0	112	176	55				
YELLOWSTONE RIVER near Sidney *	MAY-JUL	5947.0	6350.0	106	131	70				
	MAY-SEP	6921.0	7352.0	106	140	74				

RESERVOIR STORAGE (1000AF) | WATERSHED SNOWPACK ANALYSIS

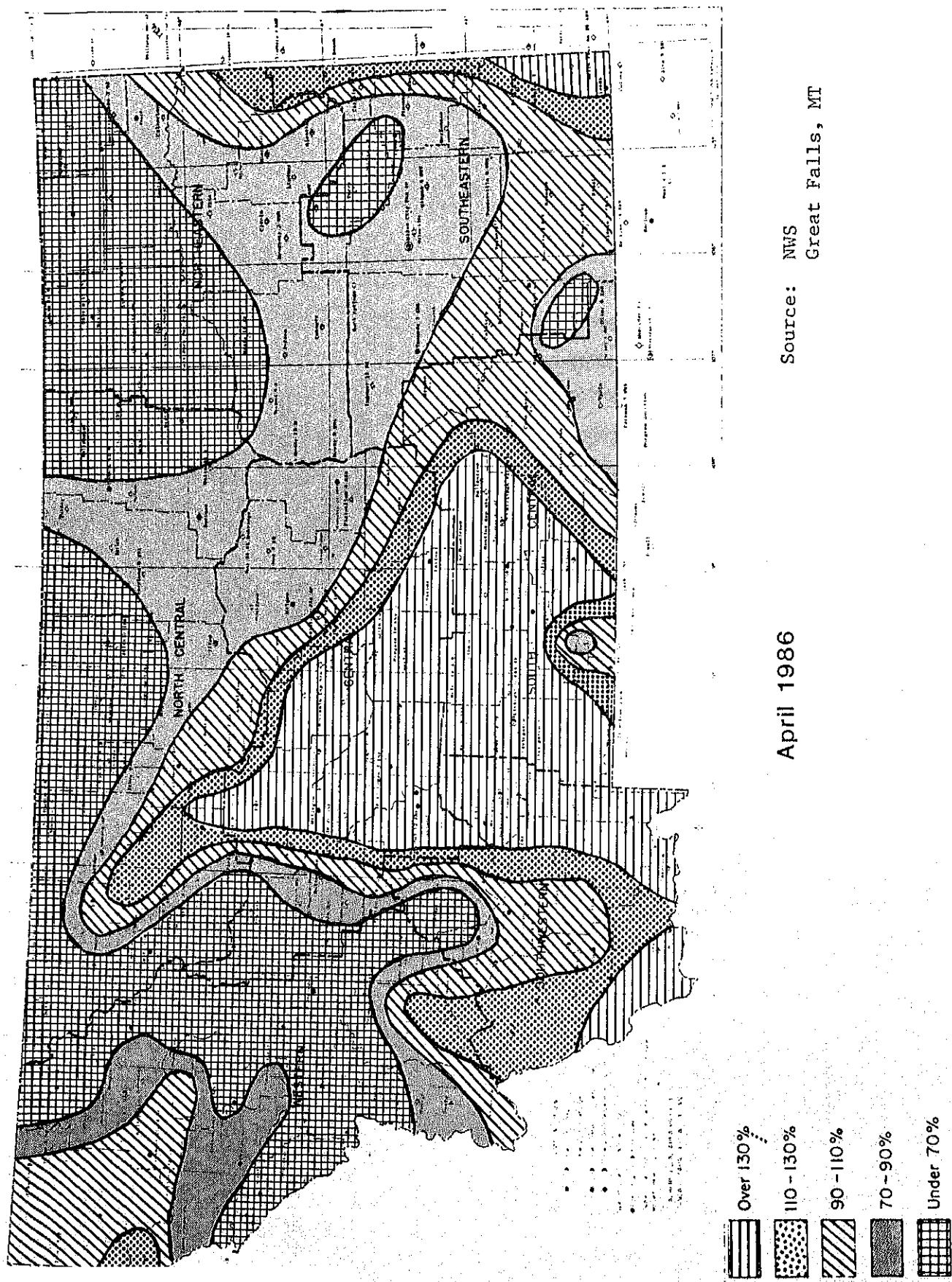
RESERVOIR	USEABLE CAPACITY	XX USEABLE STORAGE XX	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE
	1 YEAR	THIS YEAR			
		AVE.			
MYSTIC LAKE	21.0	1.1	1.0	2.4	YELLOWSTONE ab LIVINGSTON 21 157 95
COONEY	27.4	24.5	22.8	18.5	SHILOHS 10 89 53
BIGHORN LAKE	1356.0	709.1	851.8	633.1	BOULDER-STILLWATER 9 130 78
TONGUE RIVER	68.0	28.3	36.4	40.0	CLARK'S FORK-ROCK CREEK 22 158 98
					YELLOWSTONE above BIGHORN 49 138 82
					LITTLE BIGHORN 5 155 102
					WIND RIVER (Wyoming) 27 250 144
					BIGHORN RIVER (Wyoming) 32 206 112
					BIGHORN BASIN (Total) 55 208 119
					TONGUE RIVER (Wyoming) 15 154 106
					POWDER RIVER (Wyoming) 15 212 105
					YELLOWSTONE RIVER 116 168 98

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.



MAY 1, 1986

VALLEY PRECIPITATION



The Following Organizations Cooperate With The Soil Conservation Service In Snow Survey Work

Canadian

Department of the Environment
Atmospheric Environment Service
Water Management Service
British Columbia Ministry of Environment
Inventory and Engineering Branch, Hydrology Section
Alberta Environment
Technical Services Division

Federal

U.S. Department of Agriculture
Forest Service
U.S. Department of the Army
Corps of Engineers
U.S. Department of Commerce
NOAA, National Weather Service
National Environmental Satellite Service
U.S. Department of the Interior
Bureau of Indian Affairs
Fish and Wildlife Service
Geological Survey
National Park Service
Bureau of Reclamation
U.S. Department of Energy
Bonneville Power Administration

State

Montana Conservation Districts
Montana Department of Fish, Wildlife, and Parks
Montana Department of Natural Resources and Conservation
Montana Department of State Lands
Montana State University - Agricultural Experiment Station
University of Montana - School of Forestry

Private

Big Sky of Montana
Butte Water Company
Flathead Valley Community College
Montana Power Company
Pondera County Canal & Reservoir Company

Other organizations and individuals furnish information for the snow survey reports.
Their cooperation is gratefully acknowledged.